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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,043	10/09/2003	Kari Kirjavainen	29385/39667	8156

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EXAMINER	
BRINEY III, WALTER F	

ART UNIT	PAPER NUMBER
2646	

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/682,043	KIRJAVAINEN, KARI	
	Examiner	Art Unit	
	Walter F. Briney III	2646	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/01/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-3, 5, 6, 12-14 and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Bolleman et al. (US Patent 5,682,075).**

Claim 1 is limited to "an electromechanical transducer." Bolleman discloses a porous gas reservoir electrostatic transducer. See Abstract. As seen in figure 2, Bolleman discloses "two transducer elements" 21 and 22. Each element has "at least two layers" 2 and 3. The layer 3 is made of an elastomeric material, which allows it to compress in the direction denoted 'd.' See column 4, line 62, through column 5, line 8. As seen in figure 2, elements 21 and 22 comprise pores 14, which allow gas (i.e. "air") to flow. Figure 2 depicts a voltage source 20 that controls the deformation of the elastomeric layers 3, which results in gas compression, and the subsequent motion of the "centre of mass." As disclosed in column 4, line 62, through column 5, line 31. Therefore, Bolleman anticipates all limitations of the claim.

Claim 2 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. Figure 2 depicts a wall 19, to which the transducer is adhered. Clearly, neither the adhesive 18 nor the wall 19 correspond to "at least one air impermeable layers." Therefore, Bolleman anticipates all limitations of the claim.

Claim 3 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. Figure 2 clearly depicts that separate wires are needed to drive each "transducer element" 21 and 22, which means they are "separately controllable." Therefore, Bolleman anticipates all limitations of the claim.

Claim 5 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. As seen in figure 2, the transducer includes an air impermeable wall 19 that allows air to flow in the manner claimed between the first 21 and second 22 "transducer elements." Therefore, Bolleman anticipates all limitations of the claim.

Claim 6 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. As seen in figure 2, the transducer comprises "at least one air permeable additional mass" 23. Therefore, Bolleman anticipates all limitations of the claim.

Claim 12 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. The transducer element 21 comprises "a porous layer" 3 that is made of thermoplastic elastomers, i.e. "nonwoven material." See column 4, lines 58-61. In the alternative, porous conductive layer 2 corresponds to the "porous layer made of a nonwoven material." Therefore, Bolleman anticipates all limitations of the claim.

Claim 13 is limited to "a transducer as claimed in claim 12," as covered by Bolleman. Apropos the primary rejection of claim 13, Bolleman discloses that

conductive sheet 2 is provided by "vacuum evaporation." See column 3, lines 43-58. Therefore, Bolleman anticipates all limitations of the claim.

Claim 14 is limited to "a transducer as claimed in claim 12," as covered by Bolleman. Apropos the alternative rejection of claim 12, conductive sheet 2 is metallic, i.e. "is electrically conductive material." Therefore, Bolleman anticipates all limitations of the claim.

Claims 17, 19 and 20 respectively recite methods that are inherently performed by the electromechanical transducers of claims 1, 3 and 2, and are rejected for the same reasons.

Claim 18 is limited to "a method as claimed in claim 17," as covered by Bolleman. As seen in figure 2, elements 21 and 22 are oppositely driven. That is, the same control signal, generated by source 20 is provided, but in opposite phase. Therefore, Bolleman anticipates all limitations of the claim.

2. Claims 1, 4 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Croft, III et al. (US Patent 6,934,402).

Claim 1 is limited to "an electromechanical transducer." Croft discloses a planar-magnetic speaker with secondary magnetic structure. See Abstract. The "transducer" of figure 3 includes "at least two transducer elements" comprising magnets 35 and 36. The elements have a "multilayer structure" evidenced by layers 15a, 15b, 35, 36 and the air gaps 31, which allows air to move, between the magnets and conductive diaphragm 21. Croft discloses that the diaphragm is displaced, such that the thickness of each element is changed. See column 9, line 63, through column 10, line 9. The diaphragm

carries conductors 27 that correspond to "controlling means" and allow air to be displaced by the diaphragm, "changing the centre of mass." Therefore, Croft anticipates all limitations of the claim.

Claim 4 is limited to "a transducer as claimed in claim 1," as covered by Croft. Croft discloses "an air impermeable layer" arranged between two "transducer elements" that include magnets 35 and 36, respectively. Therefore, Croft anticipates all limitations of the claim.

Claim 15 is limited to "a transducer as claimed in claim 1," as covered by Croft. Croft discloses "magnetized layers" 35 and 36 and "air gaps" 31 that are "arranged between the magnetized layers." Therefore, Croft anticipates all limitations of the claim.

3. Claims 1 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Tamura et al. (US Patent 3,894,199).

Claim 1 is limited to "an electromechanical transducer." Tamura discloses an electret electrostatic electroacoustic transducer. See Abstract. As seen in figure 2, Tamura discloses "a transducer" comprising "at least two transducer elements" of "multilayer structure" comprising elements 21, 211, 212, 22, 221 and 222. As seen, an air gap exists between each element and a diaphragm 23, the air gaps also comprise part of the multilayer structure. The air gaps allow air to flow. The diaphragm bends to adjust the thickness of the air gaps, and thus, the "thickness" of each element. The diaphragm also displaces mass, thereby shifting the "center of mass." As seen in figure 2, "controlling means" 26 is applied to stimulate the diaphragm's motion. Therefore, Tamura anticipates all limitations of the claim.

Claim 16 is limited to "a transducer as claimed in claim 1," as covered by Tamura. As seen in figure 2, each element comprises "a porous layer" 211 and 221 with an electret 212 and 222 formed at "separate points" on the porous layer. See column 1, lines 62-66. Therefore, Tamura anticipates all limitations of the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 7, 8, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolleman in view of Kirjavainen (US Patent 4,654,546).

Claim 7 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. It is noted that Bolleman simply does not disclose, teach or suggest the use of "feedback for linearizing the operation of the transducer." However, this deficiency is overcome by an obvious modification.

In particular, Kirjavainen teaches an electromechanical film that includes a piezoelectric layer 13 for measuring pressure applied thereto. The resulting electrical signal is used as a control feedback 15, so that reproduced sound may closely follow that of the input control voltage 17. See figure 5b and column 4, lines 48-56. In this way, distortion created by the transducer disclosed by Bolleman is substantially eliminated.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide feedback as taught by Kirjavainen for the purpose of forcing reproduced sound to exactly follow that of the input signal.

Claim 8 is limited to "a transducer as claimed in claim 7," as covered by Bolleman in view of Kirjavainen. As noted in the rejection of claim 7, Kirjavainen teaches using a piezoelectric "sensor" to provide feedback. Therefore, Bolleman in view of Kirjavainen makes obvious all limitations of the claim.

Claims 21 and 22 respectively recite methods that are inherently performed by the electromechanical transducers of claims 7 and 8, and are rejected for the same reasons.

5. Claims 9-11 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolleman in view of Brettell (US Patent 3,136,867).

Claim 9 is limited to "a transducer as claimed in claim 1," as covered by Bolleman. It is noted that Bolleman simply does not disclose, teach or suggest the use of "filtering means arranged to filter a signal to be fed into different layers." However, this deficiency is overcome by an obvious modification.

In particular, Brettell teaches an electrostatic transducer with "filtering means" as illustrated in figure 7. Brettell teaches that large stacks of transducer elements encounter phase shift caused by the difference in delay between air and electrical signals. See column 6, lines 43-65. The phase shift leads to output cancellations. See column 6, lines 65-67. Brettell reconciles the phase shift with electrical filters.

It would have been obvious to one of ordinary skill in the art at the time of the invention to eliminate phase shift for large stacks (i.e. figure 2 of Bolleman) of transducer elements with electrical filters as taught by Brettell for the purpose of preventing output cancellations.

Claim 10 is limited to "a transducer as claimed in claim 9," as covered by Bolleman in view of Brettell. As seen in figure 7 of Brettell, no frequencies are filtered off from outer layers 121 and 122, while high frequencies are filtered off to inner layers 123-127. Therefore, Bolleman in view of Brettell makes obvious all limitations of the claim.

Claim 11 is limited to "a transducer as claimed in claim 9 or 10," as covered by Bolleman in view of Brettell. While inductors 131 are illustrated in figure 7, it is noted that such devices have an inherent resistive response. Therefore, Bolleman in view of Brettell makes obvious all limitations of the claim.

Claims 23-25 respectively recite methods that are inherently performed by the electromechanical transducers of claims 9-11, and are rejected for the same reasons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Walter F. Briney III whose telephone number is 571-272-7513. The examiner can normally be reached on M-F 8am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

WFB

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SUPERVISORY PATENT EXAMINER